



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A47L 3/04	A1	(11) International Publication Number: WO 98/32364 (43) International Publication Date: 30 July 1998 (30.07.98)
(21) International Application Number: PCT/US98/01328 (22) International Filing Date: 22 January 1998 (22.01.98) (30) Priority Data: 08/788,210 27 January 1997 (27.01.97) US (71) Applicant: DALLOZ SAFETY, INC. [US/US]; Second & Washington Streets, P.O. Box 622, Reading, PA 19603-0622 (US). (72) Inventor: TAYLOR, Robert, A.; 346 Oak Road, Oil City, PA 16301 (US). (74) Agent: BARTONY, Henry, E., Jr.; Bartony Hare & Edson, Law & Finance Building, Suite 1801, 429 Fourth Avenue, Pittsburgh, PA 15219 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: ATTACHMENT RING ASSEMBLY FOR A SAFETY HARNESS AND METHOD OF ATTACHING ATTACHMENT RING TO A SAFETY HARNESS		
(57) Abstract <p>The present invention provides an attachment ring assembly (10) for attachment to a safety harness (100) and a method of attaching such an attachment ring to a safety harness. The safety harness comprises a first strap and a second strap. The attachment ring assembly comprises an attachment ring (15) and a connecting member (20) attached to the attachment ring. The connecting member is attached to the attachment ring to have a first end and a second end extending from the attachment ring. The attachment ring assembly further comprises a first attachment member (30) attached to the first end of the connecting member. The first attachment member is adapted to be attachable to the first strap of the safety harness. The attachment ring assembly also comprises a second attachment member (35) attached to the second end of the connecting member. The second attachment member is adapted to be attachable to the second strap of the safety harness.</p> <div> </div>		

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TITLE

ATTACHMENT RING ASSEMBLY FOR A SAFETY HARNESS AND METHOD OF ATTACHING ATTACHMENT RING
TO A SAFETY HARNESS

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Field of the Invention

The present invention relates to an attachment ring assembly and to a method of attachment of an attachment ring and, particularly, to an adjustable attachment ring assembly for a safety harness and to a method of attachment of an adjustable attachment ring to a safety harness.

Background of the Invention

Safety harnesses are commonly used as part of a fall protection system for persons subjected to the potential of a fall from a height. In the workplace, full-body safety harnesses are generally used. Such harnesses, which typically include shoulder straps, can be designed in many alternative manners. See, for example, U.S. Patent Nos. 5,531,292, 5,329,844, and 5,203,829.

Typically, safety harnesses include one or more attachment rings (often referred to as a D-rings) to which a positioning line or a lifeline may be attached to position or to secure, respectively, the user of the safety harness. In general, such attachment rings are attached to the safety harness at the same position on each harness at the time of manufacture. For different uses, however, it may be desirable to attach the attachment ring at a different position on the harness. This result is particularly desirable in the case of

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attachment rings to be used with positioning lines. The design and methods of attachment of current attachment rings, however, often make it difficult and/or expensive to manufacture safety harnesses in which one or more attachment rings are positioned on the safety harness for a particular purpose or use.

Moreover, attempts to manufacture safety harnesses in which the position of an attachment ring on the safety harness is adjustable after manufacture thereof have met with limited success. In a number of such safety harness, the shoulder straps of the harness are crossed through an integral loop or channel formed on the attachment ring to connect the attachment ring to the safety harness. An adjustable link or buckle may also be provided on the safety harness in the vicinity of the attachment ring. In general, such attachment rings are very difficult to adjust. Further, crossing or intersection of the shoulder straps leads to excessive pressure on the neck of the user and limited motion.

It is, therefore, very desirable to develop an attachment ring assembly and a method of attachment of an attachment ring with facilitates the positioning of the attachment ring at various positions on the safety harness.

Summary of the Invention

In general, the present invention provides an attachment ring assembly for attachment to a safety harness. The safety harness comprises a first strap and a second strap. The attachment ring assembly comprises an attachment ring and a connecting member attached to the attachment ring. The connecting member is attached to the attachment ring to have a first end and a second end extending from the attachment ring.

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The attachment ring assembly further comprises a first attachment member attached to the first end of the connecting member. The first attachment member is adapted to be attachable to the first strap of the safety harness. The attachment ring assembly also comprises a second attachment member attached to the second end of the connecting member. The second attachment member is adapted to be attachable to the second strap of the safety harness. Preferably, the first attachment member and the second attachment member are adjustable in position after attachment to the first strap and the second strap of the safety harness, respectively. In this manner, the position of the attachment ring is made adjustable after attachment to the safety harness.

The attachment ring assembly also preferably comprises at least one cross member attached thereto. The cross member may be attached to the connecting member. The cross member preferably forms at least one loop to extend around at least one of the first strap and the second strap.

The present invention also provides a method of attaching an attachment ring to a safety harness. The safety harness comprises a first strap and a second strap. The method comprises the steps of:

- a. attaching an attachment ring to a connecting member such that a first end of the connecting member and a second end of the connecting member extend from the attachment ring;
- b. attaching a first attachment member to the first end of the connecting member;
- c. attaching a second attachment member to the second end of the connecting member;

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- d. attaching the first attachment member to the first strap; and
- e. attaching the second attachment member to the second strap.

5 As discussed above, the first and second attachment members are preferably adjustable to enable adjustment of the position of the attachment ring on the safety harness.

Preferably, the method of the present invention also comprises the steps of:

- 10 f. attaching a cross member to at least one of the first end and the second end of the connecting member, the cross member forming a loop to encompass the first strap and the second strap.

Brief Description of the Drawings

15 Figure 1 illustrates a safety harness comprising one embodiment of an attachment ring assembly of the present invention.

Figure 2 illustrates the assembly of the attachment ring assembly of Figure 1.

20 Detailed Description of the Invention

Attachment ring or D-ring assembly 10 is attachable to a full body safety harness 100 as illustrated in Figure 1. Although Figure 1 provides one example of a full body safety harness, such harnesses can be designed in many alternative

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manners. The present invention is generally applicable to any safety harness design having two spaced straps (for example, shoulder straps which extend over the shoulders of the user). As used herein, the phrase "spaced straps" refers to straps that do not intersect in the vicinity of the attachment ring. Preferably, such straps extend generally parallel to each other.

As best illustrated in Figures 2A and 2B, attachment ring assembly 10 comprises a attachment ring 15 suitable for connection to, for example, a lifeline or lanyard. Substantially any attachment ring as known in the art is suitable for use in the present invention. Attachment ring assembly 10 further comprises a connecting member 20 which is preferably fabricated from an integral length of a flexible, resilient material such as a webbing material as known in the harness arts. Such webbing materials are typically fabricated from flexible, resilient polymeric materials such as nylon. Connecting member 20 may, however, be fabricated from a rigid material. As clear to one skilled in the art, any material used for connecting member must have suitable strength to withstand the forces experienced during use of safety harness 100. Connecting member 20 may loop around an attachment bar 25 connected to attachment ring 15. Alternatively, connecting member 20 may pass directly through attachment ring 15. Moreover, connecting member 20 may comprises two separate (non-integral) extending members or ends, each of which is secured to attachment ring 15.

One extending end of connecting member 20 is connected to a first harness attachment member 30. The other extending end of connecting member 20 is preferably connected to a second harness attachment member 35. Preferably, first and second harness attachment members 30 and 35 comprise adjustable friction buckles as known in the art. Preferably, the extending ends of connecting member 20 are connected to first and second adjustable buckles 30 and 35 (or other

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attachment members) and are looped back to be attached to connecting member 20 (for example, via stitching) as illustrated in Figure 2A to retain first and second buckles 30 and 35.

5 As illustrate in Figure 1, the shoulder straps of safety harness 100 pass through buckles 30 and 35 to adjustably connect attachment ring assembly 10 to safety harness 100. In general, friction buckles 30 and 35 prevent undesirable repositioning of attachment ring assembly 10 during use of safety harness 100, but allow easy adjustment of the position of attachment ring assembly 10 when desired by the user.

15 Preferably, the safety harness straps to which attachment ring assembly 10 are attached are maintained in spaced relation to each other after attachment of attachment ring assembly 10. Preferably, the straps are maintained at least two inches apart in the vicinity of attachment ring assembly 10. Maintaining such spacing of the safety harness straps assists in preventing loss of mobility of the user and excessive discomfort of the user often associated with crossing of straps and, in particular, crossing of shoulder straps.

25 Preferably, attachment ring assembly 10 is further provided with at least one cross member or strap 40 which is preferably fabricated from webbing material as known in the harness arts. Cross member 40 may, however, be fabricated from a rigid material. As best illustrated in Figures 2A and 2B, connecting member 20 is preferably attached to cross strap 40 via stitching of at least one of the two ends of connecting member 20 to cross strap 40. Free ends 42 and 44 of cross strap 40 may be attached as illustrated in Figure 2B to form a loop. Alternatively, free end 42 can be attached to cross strap 40 to form a first loop through which one shoulder strap passes, and free end 44 can be attached to cross

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strap 40 to form a second loop through which the other shoulder strap passes. Upon connection of attachment ring assembly 10 to safety harness 100, the shoulder straps of safety harness 100 pass through the loop(s) formed by cross strap(s) or member(s) 40 and then through buckles 30 and 35. Cross strap 40 assists in ensuring a secure connection between attachment ring assembly 10 and safety harness 100 and provides one or more guide loops or channels for adjustable positioning of attachment ring assembly 10 on the straps of safety harness 100. As clear to one skilled in the art and as described above, the present invention is easily added to many existing designs of full body safety harnesses to place an adjustable attachment ring or D-ring at substantially any appropriate position on the safety harness.

Although the present invention has been described in detail in connection with the above examples, it is to be understood that such detail is solely for that purpose and that variations can be made by those skilled in the art without departing from the spirit of the invention except as it may be limited by the following claims.

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WHAT IS CLAIMED IS:

1. An attachment ring assembly for attachment to a safety harness, the safety harness comprising a first strap and a second strap, the attachment ring assembly comprising:

- a. an attachment ring;
- b. a connecting member attached to the attachment ring to have a first end and a second end extending from the attachment ring;
- c. a first attachment member attached to the first end of the connecting member, the first attachment member being adapted to be attachable to the first strap of the safety harness; and
- d. a second attachment member attached to the second end of the connecting member, the second attachment member being adapted to be attachable to the second strap of the safety harness.

2. The attachment ring assembly of Claim 1 wherein the first attachment member and the second attachment member are adapted to be adjustable in position after attachment to the first strap and the second strap, respectively.

3. The attachment ring assembly of Claim 2 further comprising at least one cross member attached thereto, the cross member forming at least one loop to encompass at least one of the first strap and the second strap.

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4.. The attachment ring assembly of Claim 3 wherein the connecting member comprises a flexible webbing material and the cross member comprises a flexible webbing material.

5. The attachment ring assembly of Claim 2 wherein the first attachment member comprises a first adjustable friction buckle and the second attachment member comprises a second adjustable friction buckle.

6. A safety harness, the safety harness comprising:

- a. a first strap;
- b. a second strap;
- c. an attachment ring assembly, the attachment ring assembly comprising:
 - i. an attachment ring;
 - ii. a connecting member attached to the attachment ring to have a first end and a second end extending from the attachment ring;
 - iii. a first attachment member attached to the first end of the connecting member, the first attachment member being attached to the first strap of the safety harness;
 - iv. a second attachment member attached to the second end of the connecting member, the

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second attachment member being attached to the second strap of the safety harness.

7. The safety harness of Claim 6 wherein the first attachment member and the second attachment member are adapted to be adjustable in position on the first strap and the second strap, respectively.

8. The safety harness of Claim 7 further comprising a cross member attached to the attachment ring assembly, the cross member forming at least one loop to encompass at least one of the first strap and the second strap.

9. The safety harness of Claim 8 wherein the connecting member comprises a flexible webbing material and the cross member comprises a flexible webbing material.

10. The safety harness of Claim 7 wherein the first attachment member comprises a first adjustable friction buckle and the second attachment member comprises a second adjustable friction buckle.

11. The safety harness of Claim 7 wherein the first strap is a first shoulder strap and the second strap is a second shoulder strap.

12. A method of attaching an attachment ring to a safety harness, the safety harness comprising a first strap and a second strap, the method comprising the steps of:

- a. attaching an attachment ring to a connecting member such that a first end of the connecting

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member and a second end of the connecting member extend from the attachment ring;

- b. attaching a first attachment member to the first end of the connecting member;
- c. attaching a second attachment member to the second end of the connecting member;
- d. attaching the first attachment member to the first strap; and
- e. attaching the second attachment member to the second strap, the first attachment member and the second attachment member being attached to the first strap and the second strap, respectively, such that a spaced separation is maintained between the first strap and the second strap in the vicinity of the attachment ring.

13. The method of Claim 12 further comprising the steps of:

- f. attaching a cross member to the connecting member, the cross member forming at least one loop to encompass at least one of the first strap and the second strap.

14. The method of Claim 12 wherein the first attachment member and the second attachment member are adapted to be adjustable in position after attachment to the first strap and the second strap, respectively.

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15. The method of Claim 13 wherein the connecting member comprises a flexible webbing material and the cross member comprises a flexible webbing material.

16. The method of Claim 14 wherein the first attachment member comprises a first adjustable friction buckle and the second attachment member comprises a second adjustable friction buckle.

17. The method of Claim 14 wherein the first strap is a first shoulder strap and the second strap is a second shoulder strap.

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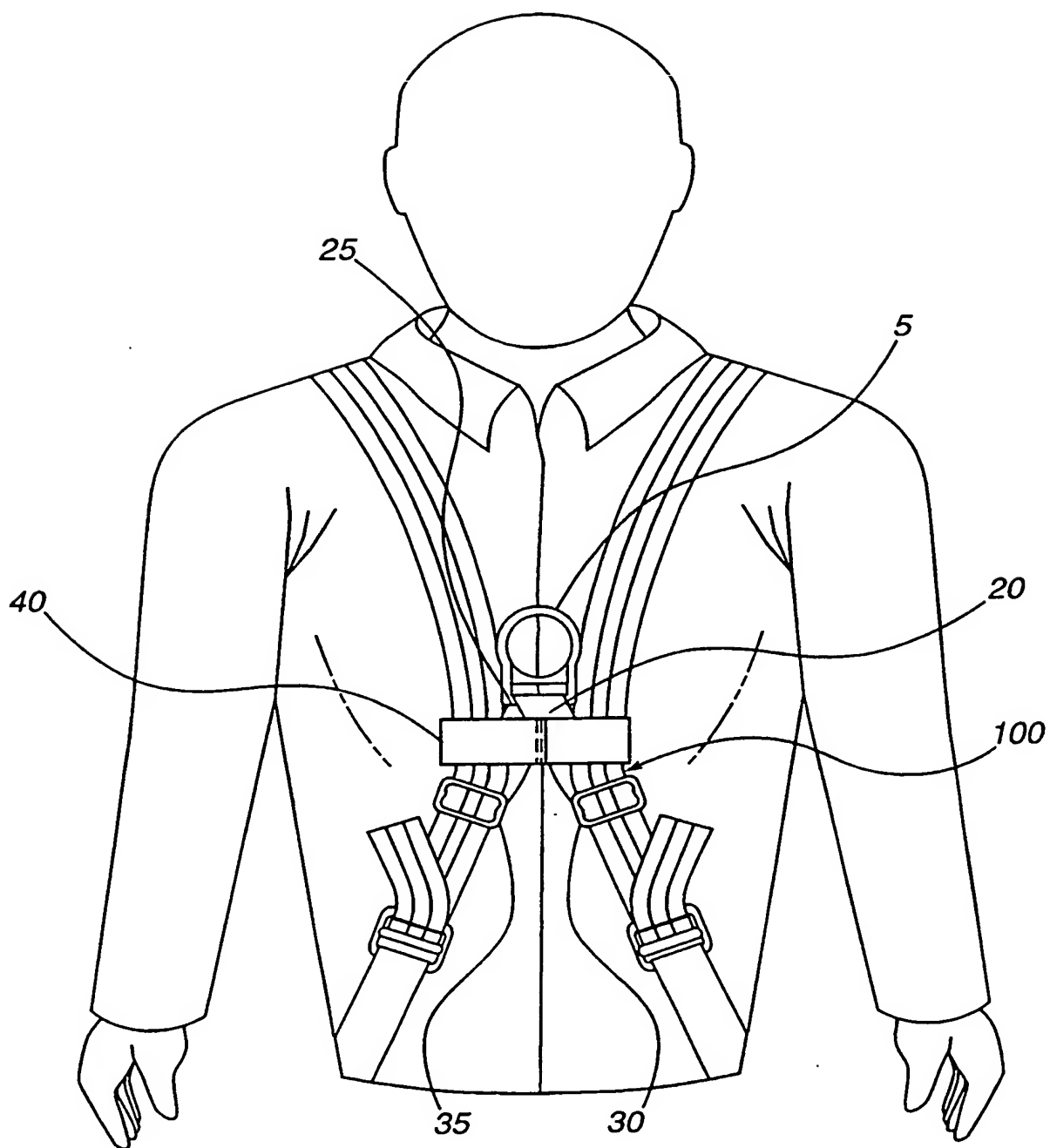


Figure 1

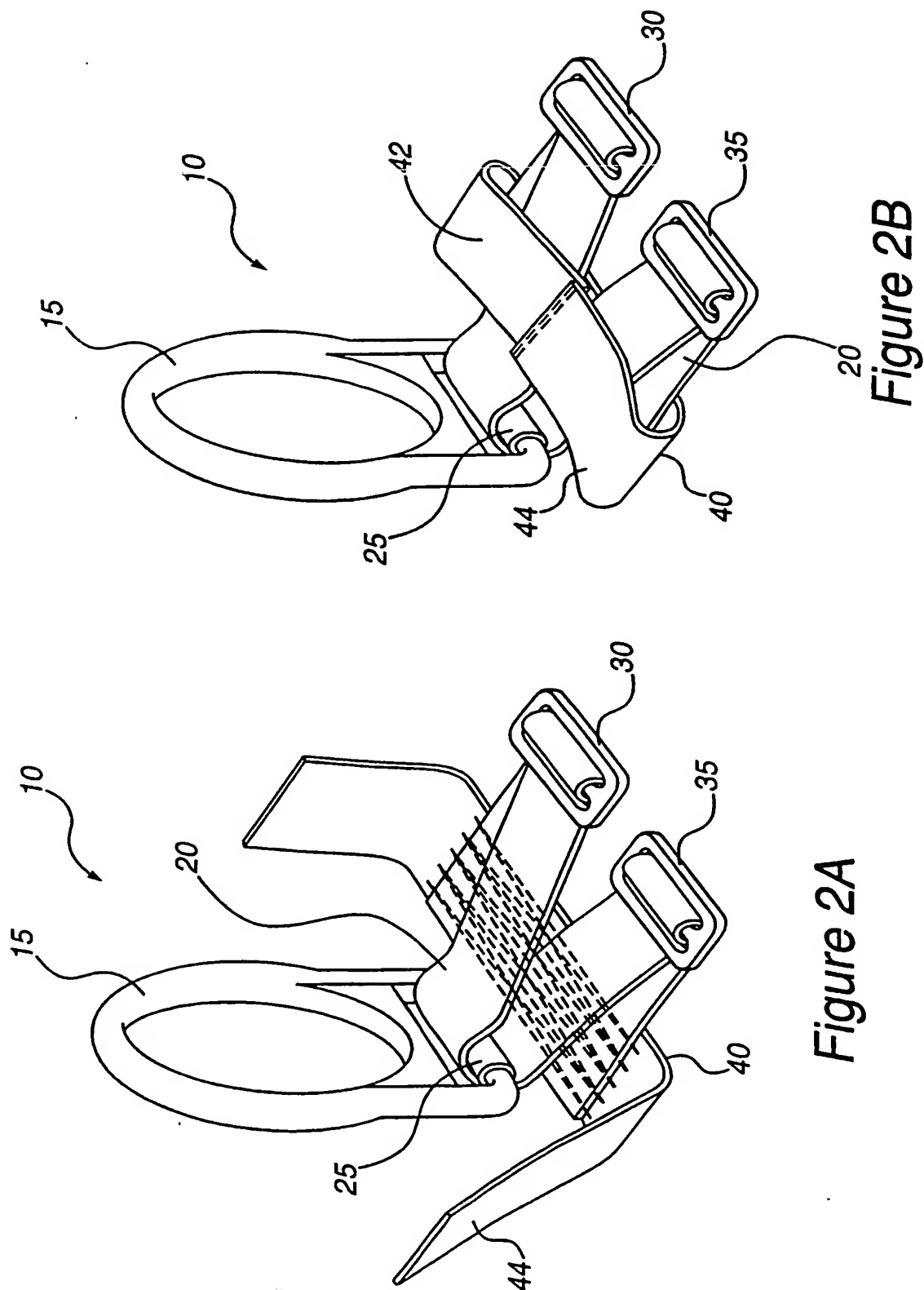


Figure 2A

Figure 2B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/01328

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A47L 3/04

US CL :182/3

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 182/3, 4, 5, 6, 7; 119/857; 224/255, 256, 257, 259; 244/151R; 297/464, 465, 466, 467

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2,887,286 A (MORAN) 19 May 1959 (19/05/59), see entire document.	1-17

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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